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AERATION TINE DEVICE

Background of the Invention

1. Field of the Invention

This invention relates to an aeration tine device for aerating turf and soil and, more particularly, to an aeration tine device with a side-ejecting opening suitable for aerating turf of a wide lawn surface such as golf courses.

2. Description of Related Art

Turf aeration is to open channels in the soil for air and water movement and gas exchange in the root zone, and traditional turf aeration involves the process of punching holes in the soil and removing a portion of the soil and thatch layer via a coring or spooning action. To improve soil aeration, turf aeration tine devices are used for extracting plugs of turf, thatch and soil. There are two basic types of aerators: solid tine, hollow tine or core. Solid tine aeration is often called spiking and involves making a hole in the sod by pushing turf and sub-surface thatch and into the root zone. Although this type of aeration is beneficial, it does not bring cores to the surface, which slows the breakdown of thatch. Hollow tine aeration speeds up the decomposition of thatch by bringing soil and thatch to the surface where air, water and microbes vigorously break down thatch.

In hollow tine aeration, the aeration tines commonly have a generally tubular shape with a tapered hollow point designed so that a portion of turf and soil enters into the tip of the tine and is ejected through the other end or a side opening of the tine. Such tines are spiked downward as the tapered point of the aeration tine device is punched toward the turf surface with prescribed force by a turf aerator generally having wheels to move the working site. The turf aerator generally has plural tine arms for detachably attaching a number of tines, and during operation, each tine arm moves up and down reciprocally to spike the turf surface.

Numerous types of turf aeration apparatus have been developed to accomplish the process of core cultivation. Tine devices of hollow type can be found in, e.g., U.S. Pat Nos. 4,924,944 and 5,495,895. In U.S. Pat No. 4,924,944, a pair of tube shaped tine members and a center bar member are coupled at each generally rectangular upper end portion of the tine member to form a side ejecting double coring tine device. Each tine member has a circular lower end having an opening in communication with a side opening provided at a center stem to facilitate penetration into the turf. In U.S. Pat No. 5,495,895, a tine device is illustrated as having a circular edge formed by thinning the forefront portion of a pipe material and having a head portion having a slightly larger diameter at the base end. The tine device is formed with an elongated hole for driving out of soil. The upper